

CLAIMS

WHAT IS CLAIMED:

1. A method of manufacturing a field emission device, the method comprising:
operating the field emission device in a pressure of at most about 10^{-8} Torr for
5 a selected period of time to evacuate outgassed materials; and
sealing the field emission device.

2. The method of claim 1, wherein operating the field emission device in the
pressure of at most about 10^{-8} Torr includes operating the field emission device in a pressure
10 of approximately 10^{-8} Torr.

3. The method of claim 1, wherein operating the field emission device in the
pressure of at most about 10^{-8} Torr for the selected period of time includes operating the field
emission device for approximately 20 minutes.

4. The method of claim 1, wherein operating the field emission device in the
pressure of approximately 10^{-8} Torr for the selected period of time includes operating the
field emission device for a period of time sufficient to remove at least a portion of
carbon-based materials from within said field emission device.

5. The method of claim 1, the method further including:
sealing the field emission device after the selected period of time.

6. The method of claim 5, wherein sealing the field emission device after the
25 selected period of time includes sealing the field emission device in a vacuum chamber.

7. The method of claim 5, wherein sealing the field emission device after the selected period of time includes sealing the field emission device in atmospheric pressure.

5 8. The method of claim 4, the method further including:
sealing the field emission device after the selected period of time.

9. A method of manufacturing a field emission device, the method comprising:
cleaning a base plate of the field emission device, the base plate having an
10 opening formed therein;
assembling the base plate with a face plate of the field emission device;
sealing the assembled base plate and face plate of the field emission device;
and
operating the sealed field emission device in a pressure of at most about
15 10^{-8} Torr for a selected period of time to evacuate outgassed materials
through the opening before sealing off the field emission device
completely.

10. The method of claim 9, wherein operating the field emission device in the
20 pressure of at most about 10^{-8} Torr includes operating the field emission device in a pressure
of approximately 10^{-8} Torr.

11. The method of claim 9, wherein operating the field emission device in the
pressure of at most about 10^{-8} Torr for the selected period of time includes operating the field
25 emission device for approximately 20 minutes.

12. The method of claim 9, wherein operating the field emission device in the pressure of approximately 10^{-8} Torr for the selected period of time includes operating the field emission device for a period of time sufficient to remove at least a portion of carbon-based materials from within said field emission device.

13. The method of claim 9, wherein sealing off the field emission device completely includes sealing the field emission device in a vacuum chamber.

14. The method of claim 9, wherein sealing off the field emission device completely includes sealing the field emission device in atmospheric pressure.

15. A field emission device formed by a method comprising:
operating the field emission device in a pressure of at most about 10^{-8} Torr for a selected period of time to evacuate outgassed materials through a tube before pinching off the tube to seal the field emission device.

16. The device of claim 15, wherein operating the field emission device in the pressure of at most about 10^{-8} Torr includes operating the field emission device in a pressure of approximately 10^{-8} Torr.

17. The device of claim 15, wherein operating the field emission device in the pressure of at most about 10^{-8} Torr for the selected period of time includes operating the field emission device for approximately 20 minutes.

18. The device of claim 15, wherein operating the field emission device in the pressure of approximately 10^{-8} Torr for the selected period of time includes operating the field emission device for a period of time sufficient to remove at least a portion of carbon-based materials from within said field emission device.

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19. The device of claim 15, wherein pinching off the tube to seal the field emission device after the selected period of time includes pinching off the tube in a vacuum chamber.

10 20. The device of claim 15, wherein pinching off the tube to seal the field emission device after the selected period of time includes pinching off the tube in atmospheric pressure.

15 21. A field emission device formed by a method comprising:
cleaning a base plate of the field emission device, the base plate having an opening for a tube;
assembling the base plate with a face plate of the field emission device;
sealing the assembled base plate and face plate of the field emission device;
and
20 operating the sealed field emission device in a pressure of at most about 10^{-8} Torr for a selected period of time to evacuate outgassed materials through the tube before pinching off the tube to seal off the field emission device completely.

22. The device of claim 21, wherein operating the field emission device in the pressure of at most about 10^{-8} Torr includes operating the field emission device in a pressure of approximately 10^{-8} Torr.

5 23. The device of claim 21, wherein operating the field emission device in the pressure of at most about 10^{-8} Torr for the selected period of time includes operating the field emission device for approximately 20 minutes.

10 24. The device of claim 21, wherein operating the field emission device in the pressure of approximately 10^{-8} Torr for the selected period of time includes operating the field emission device for a period of time sufficient to remove at least a portion of carbon-based materials from within said field emission device.

15 25. The device of claim 21, the method further including:
pinching off the tube to seal off the field emission device completely after the selected period of time.

20 26. The device of claim 25, wherein pinching off the tube to seal off the field emission device completely after the selected period of time includes pinching off the tube in a vacuum chamber.

27. The device of claim 25, wherein pinching off the tube to seal off the field emission device completely after the selected period of time includes pinching off the tube in atmospheric pressure.